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Getting Better Signals Out of the Brain: Decoding Algorithms and Autonomous Electrodes

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This talk will summarize our efforts to develop new technologies whose aim is to improve the quality and quantity of the information derived from extracellular recordings. This work is motivated by ongoing activities at Caltech to develop neural prostheses based on the brain's Parietal Reach Region (PRR). The talk will first review our progress towards developing a functioning neural prosthesis in order to motivate the need to develop long-lasting chronic interfaces between electrodes and neurons. The second half of the talk will focus on our efforts to develop a new class of "movable" electrodes that autonomously isolate a neural cell so as to optimize the recorded signal quality, and then maintain optimal signal quality using feedback. Such devices are likely to improve the reliability and robustness of future chronic neural prosthetic systems. We will also summarize current research in neural decoding algorithms, whose aim is to extract the maximum information content from the recorded signals.

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